T. Andres

1646

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RAW SEQUENCE LISTING              DATE: 09/26/2000
PATENT APPLICATION:  US/09/423,943   TIME: 16:40:05

Input Set : A:\Cbm-70wo.app
Output Set: N:\CRF3\09262000\I423943.raw
```

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   3 <110> APPLICANT: Sampath, Kuber T.
   4        Cohen, Charles M.
   6 <120> TITLE OF INVENTION: Methods For Tissue Morphogenesis and Methods for
   7        Evaluating Morphogenic Activity
   9 <130> FILE REFERENCE: Seq. Listing For CBM-70 WO
  11 <140> CURRENT APPLICATION NUMBER: 09/423943
C--> 12 <141> CURRENT FILING DATE: 2000-03-18
  14 <160> NUMBER OF SEQ ID NOS: 9
  16 <170> SOFTWARE: PatentIn Ver. 2.0
  18 <210> SEQ ID NO: 1
  19 <211> LENGTH: 1822
  20 <212> TYPE: DNA
  21 <213> ORGANISM: Homo sapiens
  23 <220> FEATURE:
  24 <221> NAME/KEY: CDS
  25 <222> LOCATION: (49)..(1341)
  26 <223> OTHER INFORMATION: "Morphogenic Protein OP-1"
  28 <400> SEQUENCE: 1
  29 ggtgcgggcc cggagcccgg agcccgggta gcgcgtagag ccggcgcg atg cac gtg   57
  30                                                         Met His Val
  31                                                          1
  33 cgc tca ctg cga gct gcg gcg ccg cac agc ttc gtg gcg ctc tgg gca  105
  34 Arg Ser Leu Arg Ala Ala Ala Pro His Ser Phe Val Ala Leu Trp Ala
  35          5                  10                  15
  37 ccc ctg ttc ctg ctg cgc tcc gcc ctg gcc gac ttc agc ctg gac aac  153
  38 Pro Leu Phe Leu Leu Arg Ser Ala Leu Ala Asp Phe Ser Leu Asp Asn
  39  20                  25                  30                  35
  41 gag gtg cac tcg agc ttc atc cac cgg cgc ctc cgc agc cag gag cgg  201
  42 Glu Val His Ser Ser Phe Ile His Arg Arg Leu Arg Ser Gln Glu Arg
  43                  40                  45                  50
  45 cgg gag atg cag cgc gag atc ctc tcc att ttg ggc ttg ccc cac cgc  249
  46 Arg Glu Met Gln Arg Glu Ile Leu Ser Ile Leu Gly Leu Pro His Arg
  47                  55                  60                  65
  49 ccg cgc ccg cac ctc cag ggc aag cac aac tcg gca ccc atg ttc atg  297
  50 Pro Arg Pro His Leu Gln Gly Lys His Asn Ser Ala Pro Met Phe Met
  51              70                  75                  80
  53 ctg gac ctg tac aac gcc atg gcg gtg gag gag ggc ggc ggg ccc ggc  345
  54 Leu Asp Leu Tyr Asn Ala Met Ala Val Glu Glu Gly Gly Gly Pro Gly
  55          85                  90                  95
  57 ggc cag ggc ttc tcc tac ccc tac aag gcc gtc ttc agt acc cag ggc  393
  58 Gly Gln Gly Phe Ser Tyr Pro Tyr Lys Ala Val Phe Ser Thr Gln Gly
  59 100                 105                 110                 115
  61 ccc cct ctg gcc agc ctg caa gat agc cat ttc ctc acc gac gcc gac  441
  62 Pro Pro Leu Ala Ser Leu Gln Asp Ser His Phe Leu Thr Asp Ala Asp
  63              120                 125                 130
  65 atg gtc atg agc ttc gtc aac ctc gtg gaa cat gac aag gaa ttc ttc  489
  66 Met Val Met Ser Phe Val Asn Leu Val Glu His Asp Lys Glu Phe Phe
```

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Input Set  : A:\Cbm-70wo.app
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67            135            140            145
69 cac cca cgc tac cac cat cga gag ttc cgg ttt gat ctt tcc aag atc    537
70 His Pro Arg Tyr His His Arg Glu Phe Arg Phe Asp Leu Ser Lys Ile
71           150            155            160
73 cca gaa ggg gaa gct gtc acg gca gcc gaa ttc cgg atc tac aag gac    585
74 Pro Glu Gly Glu Ala Val Thr Ala Ala Glu Phe Arg Ile Tyr Lys Asp
75      165            170            175
77 tac atc cgg gaa cgc ttc gac aat gag acg ttc cgg atc agc gtt tat    633
78 Tyr Ile Arg Glu Arg Phe Asp Asn Glu Thr Phe Arg Ile Ser Val Tyr
79 180            185            190            195
81 cag gtg ctc cag gag cac ttg ggc agg gaa tcg gat ctc ttc ctg ctc    681
82 Gln Val Leu Gln Glu His Leu Gly Arg Glu Ser Asp Leu Phe Leu Leu
83                200            205            210
85 gac agc cgt acc ctc tgg gcc tcg gag gag ggc tgg ctg gtg ttt gac    729
86 Asp Ser Arg Thr Leu Trp Ala Ser Glu Glu Gly Trp Leu Val Phe Asp
87           215            220            225
89 atc aca gcc acc agc aac cac tgg gtg gtc aat ccg cgg cac aac ctg    777
90 Ile Thr Ala Thr Ser Asn His Trp Val Val Asn Pro Arg His Asn Leu
91           230            235            240
93 ggc ctg cag ctc tcg gtg gag acg ctg gat ggg cag agc atc aac ccc    825
94 Gly Leu Gln Leu Ser Val Glu Thr Leu Asp Gly Gln Ser Ile Asn Pro
95      245            250            255
97 aag ttg gcg ggc ctg att ggg cgg cac ggg ccc cag aac aag cag ccc    873
98 Lys Leu Ala Gly Leu Ile Gly Arg His Gly Pro Gln Asn Lys Gln Pro
99 260            265            270            275
101 ttc atg gtg gct ttc ttc aag gcc acg gag gtc cac ttc cgc agc atc   921
102 Phe Met Val Ala Phe Phe Lys Ala Thr Glu Val His Phe Arg Ser Ile
103                280            285            290
105 cgg tcc acg ggg agc aaa cag cgc agc cag aac cgc tcc aag acg ccc   969
106 Arg Ser Thr Gly Ser Lys Gln Arg Ser Gln Asn Arg Ser Lys Thr Pro
107           295            300            305
109 aag aac cag gaa gcc ctg cgg atg gcc aac gtg gca gag aac agc agc   1017
110 Lys Asn Gln Glu Ala Leu Arg Met Ala Asn Val Ala Glu Asn Ser Ser
111           310            315            320
113 agc gac cag agg cag gcc tgt aag aag cac gag ctg tat gtc agc ttc   1065
114 Ser Asp Gln Arg Gln Ala Cys Lys Lys His Glu Leu Tyr Val Ser Phe
115      325            330            335
117 cga gac ctg ggc tgg cag gac tgg atc atc gcg cct gaa ggc tac gcc   1113
118 Arg Asp Leu Gly Trp Gln Asp Trp Ile Ile Ala Pro Glu Gly Tyr Ala
119 340            345            350            355
121 gcc tac tac tgt gag ggg gag tgt gcc ttc cct ctg aac tcc tac atg   1161
122 Ala Tyr Tyr Cys Glu Gly Glu Cys Ala Phe Pro Leu Asn Ser Tyr Met
123                360            365            370
125 aac gcc acc aac cac gcc atc gtg cag acg ctg gtc cac ttc atc aac   1209
126 Asn Ala Thr Asn His Ala Ile Val Gln Thr Leu Val His Phe Ile Asn
127           375            380            385
129 ccg gaa acg gtg ccc aag ccc tgc tgt gcg ccc acg cag ctc aat gcc   1257
130 Pro Glu Thr Val Pro Lys Pro Cys Cys Ala Pro Thr Gln Leu Asn Ala
131           390            395            400
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        Input Set : A:\Cbm-70wo.app
        Output Set: N:\CRF3\09262000\I423943.raw

```
133 atc tcc gtc ctc tac ttc gat gac agc tcc aac gtc atc ctg aag aaa   1305
134 Ile Ser Val Leu Tyr Phe Asp Asp Ser Ser Asn Val Ile Leu Lys Lys
135     405                 410                 415
137 tac aga aac atg gtg gtc cgg gcc tgt ggc tgc cac tagctcctcc         1351
138 Tyr Arg Asn Met Val Val Arg Ala Cys Gly Cys His
139 420                 425                 430
141 gagaattcag accctttggg gccaagtttt tctggatcct ccattgctcg ccttggccag 1411
143 gaaccagcag accaactgcc ttttgtgaga ccttcccctc cctatcccca actttaaagg 1471
145 tgtgagagta ttaggaaaca tgagcagcat atggcttttg atcagttttt cagtggcagc 1531
147 atccaatgaa caagatccta caagctgtgc aggcaaaacc tagcaggaaa aaaaaacaac 1591
149 gcataaagaa aaatggccgg gccaggtcat tggctgggaa gtctcagcca tgcacggact 1651
151 cgtttccaga ggtaattatg agcgcctacc agccaggcca cccagccgtg ggaggaaggg 1711
153 ggcgtggcaa ggggtgggca cattggtgtc tgtgcgaaag gaaaattgac ccggaagttc 1771
155 ctgtaataaa tgtcacaata aaacgaatga atgaaaaaaa aaaaaaaaaa a           1822
158 <210> SEQ ID NO: 2
159 <211> LENGTH: 431
160 <212> TYPE: PRT
161 <213> ORGANISM: Homo sapiens
163 <400> SEQUENCE: 2
164 Met His Val Arg Ser Leu Arg Ala Ala Ala Pro His Ser Phe Val Ala
165  1               5                  10                  15
167 Leu Trp Ala Pro Leu Phe Leu Leu Arg Ser Ala Leu Ala Asp Phe Ser
168             20                  25                  30
170 Leu Asp Asn Glu Val His Ser Ser Phe Ile His Arg Arg Leu Arg Ser
171         35                  40                  45
173 Gln Glu Arg Arg Glu Met Gln Arg Glu Ile Leu Ser Ile Leu Gly Leu
174     50                  55                  60
176 Pro His Arg Pro Arg Pro His Leu Gln Gly Lys His Asn Ser Ala Pro
177 65                  70                  75                  80
179 Met Phe Met Leu Asp Leu Tyr Asn Ala Met Ala Val Glu Glu Gly Gly
180                 85                  90                  95
182 Gly Pro Gly Gly Gln Gly Phe Ser Tyr Pro Tyr Lys Ala Val Phe Ser
183             100                 105                 110
185 Thr Gln Gly Pro Pro Leu Ala Ser Leu Gln Asp Ser His Phe Leu Thr
186         115                 120                 125
188 Asp Ala Asp Met Val Met Ser Phe Val Asn Leu Val Glu His Asp Lys
189     130                 135                 140
191 Glu Phe Phe His Pro Arg Tyr His His Arg Glu Phe Arg Phe Asp Leu
192 145                 150                 155                 160
194 Ser Lys Ile Pro Glu Gly Glu Ala Val Thr Ala Ala Glu Phe Arg Ile
195                 165                 170                 175
197 Tyr Lys Asp Tyr Ile Arg Glu Arg Phe Asp Asn Glu Thr Phe Arg Ile
198             180                 185                 190
200 Ser Val Tyr Gln Val Leu Gln Glu His Leu Gly Arg Glu Ser Asp Leu
201         195                 200                 205
203 Phe Leu Leu Asp Ser Arg Thr Leu Trp Ala Ser Glu Glu Gly Trp Leu
204     210                 215                 220
206 Val Phe Asp Ile Thr Ala Thr Ser Asn His Trp Val Val Asn Pro Arg
207 225                 230                 235                 240
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Input Set : A:\Cbm-70wo.app
Output Set: N:\CRF3\09262000\I423943.raw
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```
209 His Asn Leu Gly Leu Gln Leu Ser Val Glu Thr Leu Asp Gly Gln Ser
210                 245             250                 255
212 Ile Asn Pro Lys Leu Ala Gly Leu Ile Gly Arg His Gly Pro Gln Asn
213             260             265             270
215 Lys Gln Pro Phe Met Val Ala Phe Phe Lys Ala Thr Glu Val His Phe
216         275             280             285
218 Arg Ser Ile Arg Ser Thr Gly Ser Lys Gln Arg Ser Gln Asn Arg Ser
219     290             295             300
221 Lys Thr Pro Lys Asn Gln Glu Ala Leu Arg Met Ala Asn Val Ala Glu
222 305             310             315                 320
224 Asn Ser Ser Ser Asp Gln Arg Gln Ala Cys Lys Lys His Glu Leu Tyr
225             325             330             335
227 Val Ser Phe Arg Asp Leu Gly Trp Gln Asp Trp Ile Ile Ala Pro Glu
228             340             345             350
230 Gly Tyr Ala Ala Tyr Tyr Cys Glu Gly Glu Cys Ala Phe Pro Leu Asn
231         355             360             365
233 Ser Tyr Met Asn Ala Thr Asn His Ala Ile Val Gln Thr Leu Val His
234     370             375             380
236 Phe Ile Asn Pro Glu Thr Val Pro Lys Pro Cys Cys Ala Pro Thr Gln
237 385             390             395                 400
239 Leu Asn Ala Ile Ser Val Leu Tyr Phe Asp Asp Ser Ser Asn Val Ile
240             405             410             415
242 Leu Lys Lys Tyr Arg Asn Met Val Val Arg Ala Cys Gly Cys His
243         420             425             430
246 <210> SEQ ID NO: 3
247 <211> LENGTH: 102
248 <212> TYPE: PRT
249 <213> ORGANISM: Artificial Sequence
251 <220> FEATURE:
252 <223> OTHER INFORMATION: Description of Artificial Sequence: OPX
254 <220> FEATURE:
255 <221> NAME/KEY: VARIANT
256 <222> LOCATION: (1)..(102)
257 <223> OTHER INFORMATION: wherein each Xaa is independently selected from a
258       group of one or more specified amino acids as
259       defined in the specification
261 <400> SEQUENCE: 3
W--> 262 Cys Xaa Xaa His Glu Leu Tyr Val Ser Phe Xaa Asp Leu Gly Trp Xaa
     263   1               5               10              15
W--> 265 Asp Trp Xaa Ile Ala Pro Xaa Gly Tyr Xaa Ala Tyr Tyr Cys Glu Gly
     266         20              25              30
W--> 268 Glu Cys Xaa Phe Pro Leu Xaa Ser Xaa Met Asn Ala Thr Asn His Ala
     269         35              40              45
W--> 271 Ile Xaa Gln Xaa Leu Val His Xaa Xaa Xaa Pro Xaa Xaa Val Pro Lys
     272     50              55              60
W--> 274 Xaa Cys Cys Ala Pro Thr Xaa Leu Xaa Ala Xaa Ser Val Leu Tyr Xaa
     275 65              70              75              80
W--> 277 Asp Xaa Ser Xaa Asn Val Ile Leu Xaa Lys Xaa Arg Asn Met Val Val
     278         85              90              95
```

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                    RAW SEQUENCE LISTING              DATE: 09/26/2000
                    PATENT APPLICATION:  US/09/423,943   TIME: 16:40:05

                    Input Set : A:\Cbm-70wo.app
                    Output Set: N:\CRF3\09262000\I423943.raw
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```
W--> 280 Xaa Ala Cys Gly Cys His
     281             100
     284 <210> SEQ ID NO: 4
     285 <211> LENGTH: 97
     286 <212> TYPE: PRT
     287 <213> ORGANISM: Artificial Sequence
     289 <220> FEATURE:
     290 <223> OTHER INFORMATION: Description of Artificial Sequence: Generic
     291       Sequence 7
     293 <220> FEATURE:
     294 <221> NAME/KEY: VARIANT
     295 <222> LOCATION: (1)..(97)
     296 <223> OTHER INFORMATION: wherein each Xaa is independently selected from a
     297       group of one or more specified amino acids defined
     298       in the specification
     300 <400> SEQUENCE: 4
W--> 301 Leu Xaa Xaa Xaa Phe Xaa Xaa Xaa Gly Trp Xaa Xaa Trp Xaa Xaa Xaa
     302 1               5               10                  15
W--> 304 Pro Xaa Xaa Xaa Xaa Ala Xaa Tyr Cys Xaa Gly Xaa Cys Xaa Xaa Pro
     305             20              25                  30
W--> 307 Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Asn His Ala Xaa Xaa Xaa Xaa
     308         35              40              45
W--> 310 Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Cys Cys Xaa Pro
     311     50              55              60
W--> 313 Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Leu Xaa Xaa Xaa Xaa Xaa Xaa Xaa
     314 65              70              75                  80
W--> 316 Val Xaa Leu Xaa Xaa Xaa Xaa Xaa Met Xaa Val Xaa Xaa Cys Xaa Cys
     317             85              90                  95
W--> 319 Xaa
     323 <210> SEQ ID NO: 5
     324 <211> LENGTH: 102
     325 <212> TYPE: PRT
     326 <213> ORGANISM: Artificial Sequence
     328 <220> FEATURE:
     329 <223> OTHER INFORMATION: Description of Artificial Sequence: Generic
     330       Sequence 8
     332 <220> FEATURE:
     333 <221> NAME/KEY: VARIANT
     334 <222> LOCATION: ()..)
     335 <223> OTHER INFORMATION: wherein each Xaa is independently selected from a
     336       group of one or more specified amino acids defined
     337       in the specification
     339 <400> SEQUENCE: 5
W--> 340 Cys Xaa Xaa Xaa Xaa Leu Xaa Xaa Xaa Phe Xaa Xaa Xaa Gly Trp Xaa
     341 1               5               10                  15
W--> 343 Xaa Xaa Xaa Xaa Xaa Pro Xaa Xaa Xaa Xaa Ala Xaa Tyr Cys Xaa Gly
     344             20              25                  30
W--> 346 Xaa Cys Xaa Xaa Pro Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Asn His Ala
     347         35              40              45
```

MI

Please Note:
Use of n and/or Xaa have been detected in the Sequence Listing. Please review the
Sequence Listing to ensure that a corresponding explanation is presented in the <220> to
<223> fields of each sequence which presents at least one n or Xaa.

VERIFICATION SUMMARY
PATENT APPLICATION: US/09/423,943

DATE: 09/26/2000
TIME: 16:40:06

Input Set : A:\Cbm-70wo.app
Output Set: N:\CRF3\09262000\I423943.raw

```
L:12  M:271 C: Current Filing Date differs, Replaced Current Filing Date
L:262 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:3
L:265 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:3
L:268 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:3
L:271 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:3
L:274 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:3
L:277 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:3
L:280 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:3
L:301 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:4
L:304 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:4
L:307 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:4
L:310 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:4
L:313 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:4
L:316 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:4
L:319 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:4
L:340 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:5
L:343 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:5
L:346 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:5
L:349 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:5
L:352 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:5
L:355 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:5
L:358 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:5
L:379 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:6
L:382 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:6
L:385 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:6
L:388 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:6
L:391 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:6
L:394 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:6
L:397 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:6
L:418 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:7
L:421 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:7
L:424 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:7
L:427 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:7
L:430 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:7
L:433 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:7
L:436 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:7
L:456 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:8
L:477 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:9
```